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ABSTRACT

Since 1992, the University of Iowa Libraries' Information Arcade, a facility designed to support the use of electronic resources in research, teaching, and independent learning, has been a springboard for developing new collaborative technology-based services. This paper describes next generation developments underway in applying learning technologies, as well as issues and challenges, including development of media user education programs, technology training programs, and building Arcade-like facilities across the campus. Projects discussed include: (1) "The White City," a hypertext-guided tour of the 1893 World's Columbia Exposition in Chicago; (2) the Information Commons, an electronic information and multimedia teaching facility; (3) the Advanced Real Time Information Center (ARCTIC), an electronic teaching facility; (4) smaller Arcade-inspired facilities; (5) Teaching with Innovative Style and Technology (TWIST), a project undertaken to design a model instructional program to assistant faculty to incorporate new technologies and information resources into their courses; and (6) new Technology in the Learning Environment (nTITLE), a campus-wide initiative involving 96 professors attending a series of workshops taught in the arcade classroom. (DLS)

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Beyond the Information Arcade™: Next Generation Collaborations for Learning and Teaching at the University of Iowa

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Abstract: Since 1992, the University of Iowa Libraries' Information Arcade has been a spring board for developing new collaborative technology-based services to support teaching, learning, and research. This paper describes next generation developments underway in applying learning technologies as well as issues and challenges, including development of media user education programs, technology training programs, and building "Arcade-like" facilities across the campus. Issues and challenges found in these new collaborative efforts will be discussed as well as "third" generation scenarios to come.

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1. INTRODUCTION

In 1992 the University of Iowa Libraries opened the Information Arcade, a unique, ground-breaking facility designed to support the use of electronic resources in research, teaching, and independent learning, and founded on the philosophy of collaboration between librarians, faculty, and information technologists [Lowry, 1994]. Over the past five years the Arcade was the focus of intense worldwide attention including winning the ALA Library of the Future Award. Five years after its opening new campus-wide technology based services are being developed to support learning, teaching, and creative research. This paper describes next generation developments in advancing collaborative learning and teaching environments in the Libraries and throughout the campus, building on experiences gained from developments in the Information Arcade.

2. ADVANCING LEARNING TECHNOLOGIES THROUGH THE INFORMATION ARCADE

Progress towards integrating computer-based multimedia programs, Internet resources, and other networked information resources by teams of faculty, librarians, and information technologists is evidence of Iowa's assimilation of the "Information Arcade" philosophy at the University of Iowa – collaboration, creative risk taking, and integration of services and staff expertise to support innovation in teaching and learning throughout the curriculum.

Elements of this experience may contain useful models for other institutions seeking to create dynamic and effective learning environments. Major issues facing research library staff and other players in the university committed to the integration of learning technologies into the curriculum are also considered.

2.1 THE WHITE CITY AND MORE: REAL APPLICATIONS WITH EXCITING RESULTS

Development of a physical space such as the Information Arcade, visually and actively demonstrating action based on an education philosophy (interactive learning combined with rich connections to networked information resources), remains a critical element in the success of current initiatives and the future developments of others. Established with a $750,000 grant from the Roy J. Carver Charitable Trust

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of Muscatine, Iowa, the Arcade consists of an electronic classroom with 24 dual platform high end workstations and an instructor's station. Beyond the classroom are clusters of multimedia workstations and information stations. All workstations are mounted on an ethernet network allowing for superior connectivity making possible the creation of the LWIS (Libraries-Wide Information System) and the Gateway to the Internet, a specially selected collection of direct links to databases, documents, image collections, WWW home pages, and other materials arranged by subject, type of information resource, and institution (http://www.lib.uiowa.edu/) [Lowry, Soderdahl, Dewey 1996].

The creation of the Information Arcade provided a dynamic way for librarians to work directly with early innovators on campus such as English Professor Brooks Landon who taught a course, "Literature and Culture of Twentieth Century America." Central to the course was the profound implications of the 1893 World's Columbia Exposition in Chicago. When taught in the Arcade's electronic classroom, the course was transformed into a hypertext-guided tour of the fair using documents, images, and photographs. The end result is a dynamic and continually emerging database Landon calls "The White City." From the research library perspective the Information Arcade provided a focus for bringing together the expertise of librarians in information resources needed for a course such Landon's with faculty who would use the facility for developing interactive learning environments and other new approaches to their courses. What occurred was a fundamental change in the way librarians and faculty worked with students and with each other. Important for librarians, the facility provided a new way to use their expertise to integrate information resources (in all formats) into courses, along with the information seeking and problem solving skills needed to sort out and apply the vast body of information resources available to students now and in the future. And, the opportunity to experiment with emerging learning technologies and creating information resources for research and teaching with Arcade technology and staff expertise was a major advancement (even prior to widespread web use). Lofty goals but doable over a relatively short period (five years) with the existence of a splashy, high profile and expertly staffed facility, the Information Arcade, and with a strong emphasis on partnerships.

3. IF WE BUILD IT THEY WILL COME

Why were librarians at the University of Iowa so interested in learning technologies to the extent that we truly believed "if we build it they will come," a famous saying from the Iowa movie *Field of Dreams*? Obvious reasons include the fact that research libraries are already immersed in the application of technology from purchasing indexes, books, and research materials in digital formats to carrying out library operations in an online environment (processing, reference, communications). For the UI Libraries it became a major way to pursue our primary goal -- "to maintain as a top priority the development and delivery of instructional programs and materials to assist students, faculty, and staff in acquiring the skills and knowledge to achieve information literacy in order to secure information needed immediately and throughout their lives [University of Iowa Libraries 1995]." And, building the Arcade enabled us to visibly address the concern that technology, in and of itself, become the driving force of advancement in the learning and teaching process.

Stephen Ruth accurately remarked in a recent *EDUCOM Review* article that technology-based learning is not about the medium but it is all about how the technology is leveraged [Ruth 1996]. Or, as a recent Pioneer Seed Corn Company television ad noted (Iowa has plenty of corn producers) we are seeking "Technology that Yields." Thus, librarians' role in working with faculty to incorporate research skills within courses in new and dynamic ways, and with networked information resources, is a natural progression of the more traditional roles of simply housing and providing access to library materials. Not only does technology "yield" under this model, but it provides mechanisms for major transformations in learning environments.

3.1 BUILDING "ARCADE-LIKE" FACILITIES THROUGHOUT THE UI LIBRARIES SYSTEM

Using the Information Arcade as a model, the Libraries, in collaboration with academic colleges and departments, have built or are planning similar facilities throughout the campus. The Information Commons, a 5,000 square foot electronic information and multimedia teaching facility at the UI Hardin Library for the Health Sciences, opened in August 1997 [Duncan 1996]. The Commons provides faculty and students, primarily from the health sciences colleges, with access to health sciences databases and computer-based learning as well a multimedia technologies that support faculty and staff in creating specialized interactive technologies. Truly a collaborative effort, use of the Commons as an instruction site has skyrocketed and it has proved to be a fruitful physical location for instructional and research-related partnerships with faculty. At this writing plans are underway for an expansion of two additional electronic classroooms (http://www.lib.uiowa.edu/commons/).

ARTIC, The Advanced Real Time Information Center, is an electronic teaching facility located in the Marvin A. Pomerantz Business Library. ARTIC's purpose is to incorporate state-of-the-art technologies for all kinds of dynamic (real time) business information sources, especially global financial trading markets, into a teaching venue for College of Business Administration faculty and librarians. ARTIC extends the collaborative and innovative philosophies of the original Arcade concept by providing an actual space for librarians and faculty to improve students' ability to compete in our real time global information-driven economy through effective navigation of business information sources.

Ongoing building projects for the Engineering Library and the Biology Library include Arcade-inspired smaller electronic teaching facilities within their walls. These facilities will provide greater access to electronic multimedia resources so important in these disciplines and bring together more students and faculty in subject-specific interactive learning environments. The facilities, planned in close collaboration with the College of Engineering and the Biological Sciences Department, provide yet more venues for dialogue with faculty regarding collaborative ventures for integrating electronic resources into their curriculum.

4. STAFF TECHNOLOGY TRAINING

Getting beyond the first wave of success the Arcade generated was a major challenge. A critical part of the University of Iowa's success in extending the Information Arcade concept was a concerted effort to broaden the technical expertise of library staff from throughout the system. This was accomplished through a variety of staff training sessions covering topics from web page creation to desktop publishing, digitizing and imaging. In order to whet staff appetite for such training as well as minimize fears, technology training days are set aside devoted to hands on experience with the latest software and hardware available for application to user education and learning technologies. The staff technology training series has resulted in an exponential growth in the number and variety of user education programs staff provide on a regular basis for the University of Iowa's 28,000 students and over 2,000 faculty.

5. INTERACTIVE AND " VIRTUAL" USER EDUCATION

Librarians trained to use, not only the electronic classroom in the Information Arcade, but other facilities around the campus, are able to integrate appropriate software and hardware solutions for the creation of interactive general discipline-specific user education sessions on library resources. Newly constructed venues and innovative technological applications have definitely added value to more traditional lecture-based modes of classroom instruction. Thus, the physical space (an electronic classroom) becomes a dynamic learning environment capable integrating information resources into truly interactive courses

ranging from Engineering to English, History to Mathematics and throughout the Health Sciences curriculum.

Extending our reach to thousands of students in a large university setting is simply not possible in classrooms (electronic or otherwise) or regularly scheduled educational sessions held in the library. Although engaged in user education programs for some years, it was clear that we were not reaching large numbers of students and faculty. For example, in 1990 a total of 393 user education sessions were held reaching 6,678 students. By 1996 the number of sessions increased to 628 reaching 12,087 students. However, this falls far short of the campus population of 27,500 students. And it was also clear that faculty and students had ever increasing needs in learning how to effectively use the more expanded, more complex, and more numerous information resources available at a large research university [Dewey 1997]. These two obstacles ranked above lack of hardware, software, or even available funds. In fact, a research project funded by the Council on Learning Resources found that a population of 1000 faculty from four research universities identified two major obstacles to increased use of electronic information technology: (1)lack of information about databases and resources and (2) lack of training in their use [Adams and Bork 1995].

One way we can hope to expand user education programs in a truly exponential way is through the implementation of broadly accessible web-based tutorials and information packages which may be used 24 hours a day by many individuals at one time. *Library Explorer*, developed initially as a hypercard program, now web-based, is a computer instruction program designed to help students learn to choose information sources and finding tools appropriate for their work. Using the book as a metaphor, *Library Explorer* directs the user to a variety of "chapters" and allows them to search the Libraries' online catalog at any point in the program (http://www.lib.uiowa.edu/libexp/). A specialized information package, *Engineering Reference Assistant*, provides students "virtual" assistance locating Engineering information resources appropriate to their needs and class projects. The *Engineering Reference Assistant* can be accessed via the Web and available anytime the student needs help (http://www.lib.uiowa.edu/eng/robo/robo1.htm). Other digital information packages for subject domains are in the planning stages at the University of Iowa Libraries.

5.1 TWIST AND SHOUT

A major issue continues to be identifying effective ways to systematically expand our reach effectively to large numbers of students through the curriculum. Thus, an initiative began in the summer of 1996 called TWIST (Teaching with Innovative Style and Technology). TWIST is a three year project funded by a $370,000 grant from the Roy J. Carver Charitable Trust. TWIST's primary goal is to design a model instructional program to assistant faculty to incorporate new technologies and information resources into their courses. During 1996/97 faculty from the Department of Communication Studies worked with TWIST staff as an initial target audience for development of materials and instructional sessions. This particular group of faculty were recruited because they represent a wide variety of interdisciplinary interests within one department, providing a broad testing ground for application of a model for humanities and social sciences (http//twist.lib.uiowa.edu). Initial TWIST projects included: assisting a Latin American media scholar to construct a web page for two courses -- U.S. Media in Latin America and Cultural Imperialism -- providing students with information about traditional and electronic information sources, and working with a cross cultural communication scholar to develop an experimental course -- Intercultural Communication Course -- using electronic communication tools to link students from Iowa to students at the University of Jyvaskyla in Finland.

As with user education programs described earlier, reaching large numbers of faculty, and consequently students in courses via the faculty was unrealistic through traditional methods. Thus, TWIST staff also are in the process of completing web-based tutorials that can be used at the faculty's convenience or point of need (http://twist.uiowa.edu/tutorials/). Topics included: Guide for Beginning Researchers at the UI

Libraries; Introduction to the Internet and the World Wide Web; E-Mail and Mailing Lists; Accessing and Using WWW Browsers; Preparing Search Strategies; Searching for Information on the WWW; Evaluating Web Resources; Finding Information on the Web; Managing Information; Introducing Basic HTML; Using a Webpage Editor: Claris Home Page; Creating a Web-based Syllabus; Converting Files to HTML; Using Web Sites in Classroom Presentations; Using PowerPoint in Classroom Presentations; Conferencing and Other Computer-Mediated Communication; Multimedia; Image and Sound Databases; Electronic Texts and Digital Libraries; and Pulling it All Together With WebCT.

During the 1997-98 academic year TWIST is focusing on developing partnerships of librarians and faculty in a program called TWISTed pairs to explore the use of web-based learning environments for specific classes. A general process for implementation of the TWISTed Pairs model is that TWIST staff: 1) meet with the librarians and show options they can use with faculty; 2) survey the librarians involved to determine current skill levels and develop a training needs assessment; 3) meet with librarian/faculty pairs to develop individualized plans; 4) continue training librarians (and faculty); and 5) work directly with faculty offering assistance as needed (http://twist.lib.uiowa.edu/projects/).

Pairs are in place with faculty from African American World Studies, American Studies, Italian, Pharmacology, Journalism, Geography, Asian Languages, Communication Studies, English, History, Rhetoric, Art History, Comparative Literature, Spanish, and Film Studies. It is hoped that this work, along with the web-based tutorials, will result in a model transferable to other academic communities.

5.2 nTITLE: A CAMPUS-WIDE INITIATIVE

TWIST staff and other librarians have begun an important collaboration with the University's Center for Teaching and Information Technology Systems (ITS) to plan and implement a state-funded program called nTITLE (new Technology in the Learning Environment). A total of 96 professors from across the campus were selected by their college deans to participate in 3.5 day 1997 summer workshops planned and taught by the Center, the Libraries, and ITS in the Information Arcade classroom. Each participant received a grant of $3000 for equipment to be used for technology-based improvements in their teaching (http://www.uiowa.edu/~ntitle/).

6. NEXT GENERATION ISSUES AND CHALLENGES

Next generation advances are naturally accompanied by major issues and challenges. The political difficulties of forging constructive alliances with departments across the campus such as libraries, information technology services departments, and academic departments can be a major barrier to productive collaboration. In today's fast-paced environment there is no time to smooth over philosophical differences or achieve consensus on every detail. All parties must be willing to take risks and move forward. This is the only way to make projects happen. Issues of copyright and other legal concerns can be paralyzing, but should not be barriers to development. Staff training and development is critical to the success of next generation initiatives because of the need for technical expertise, not to mention the necessity of adequately maintaining the hardware and software behind the new learning technologies. Expertise in instructional development and computer-based design is also essential. Also, administrators must consider when to create from scratch or when to implement models taken from other institutions. Basic training of faculty and students in the new technologies is a major need which should not be taken for granted. For example, we found in a pilot needs assessment of beginning University of Iowa freshman, that only 30% were using the Libraries' web-based systems. Therefore, the need for ongoing evaluation and assessment is critical. Recognition via the promotion and tenure system found at the University of Iowa (and most colleges and universities across the U.S.) remains a major issue among faculty who are considering spending time applying learning technologies or developing multimedia research projects.

7. A THIRD GENERATION IS ON THE HORIZON

Advancing the Information Arcade philosophy of transformation through collaboration and creative use of learning technologies and networked information resources to another level is essential for the Libraries' efforts to remain relevant and central to the teaching and research missions of the University. Increasing partnerships and collaboration with faculty and students will become more and more integrated into daily work. Without this kind of major transformation I believe we would not be major players in planning for next steps in the University's advancement of its teaching and research missions. With the groundwork laid by the Information Arcade implementation and development we are an essential part of the University and the State of Iowa's new emphasis on integrating instructional technology into all aspects of university life ensuring that graduates will have the tools they need to function effectively in the next information age and beyond.

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